



- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent Cdv/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary



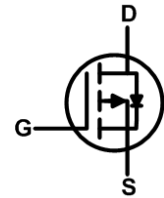
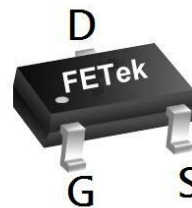
BVDSS	RDSON	ID
-20V	75mΩ	-3.1A

Description

The FKUC2609 is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.

The FKUC2609 meets the RoHS and Green Product requirement with full function reliability approved.

SOT23S Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		10s	Steady State	
V_{DS}	Drain-Source Voltage	-20		V
V_{GS}	Gate-Source Voltage	± 12		V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -4.5\text{V}^1$	-3.5	-3.1	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ -4.5\text{V}^1$	-2.8	-2.5	A
I_{DM}	Pulsed Drain Current ²	-15.5		A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ³	1.32	1	W
$P_D@T_A=70^\circ\text{C}$	Total Power Dissipation ³	0.84	0.64	W
T_{STG}	Storage Temperature Range	-55 to 150		$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150		$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	125	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ ($t \leq 10\text{s}$)	---	95	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	80	$^\circ\text{C/W}$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=-1mA$	---	-0.01	---	$V/^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-4.5V$, $I_D=-3A$	---	60	75	$m\Omega$
		$V_{GS}=-2.5V$, $I_D=-2A$	---	85	105	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-0.5	---	-1.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2.98	---	$mV/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-16V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-16V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA
gfs	Forward Transconductance	$V_{DS}=-5V$, $I_D=-3A$	---	9	---	S
Q_g	Total Gate Charge (-4.5V)	$V_{DS}=-15V$, $V_{GS}=-4.5V$, $I_D=-3A$	---	9.7	13.6	nC
Q_{gs}	Gate-Source Charge		---	2.05	2.9	
Q_{gd}	Gate-Drain Charge		---	2.43	3.4	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-10V$, $V_{GS}=-4.5V$, $R_G=3.3\Omega$ $I_D=-3A$	---	4.8	9.6	ns
T_r	Rise Time		---	9.6	17.3	
$T_{d(off)}$	Turn-Off Delay Time		---	52	104	
T_f	Fall Time		---	8.4	16.8	
C_{iss}	Input Capacitance	$V_{DS}=-15V$, $V_{GS}=0V$, $f=1MHz$	---	686	960	pF
C_{oss}	Output Capacitance		---	90.8	127	
C_{rss}	Reverse Transfer Capacitance		---	80.4	113	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	-3.1	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^\circ\text{C}$	---	---	-1	V

Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The power dissipation is limited by 150°C junction temperature
4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics

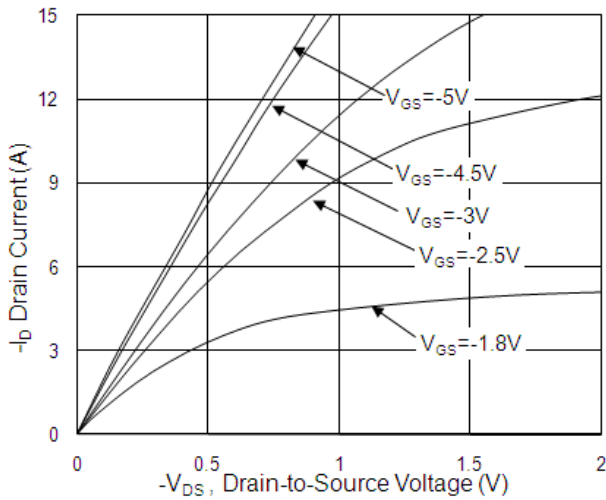


Fig.1 Typical Output Characteristics

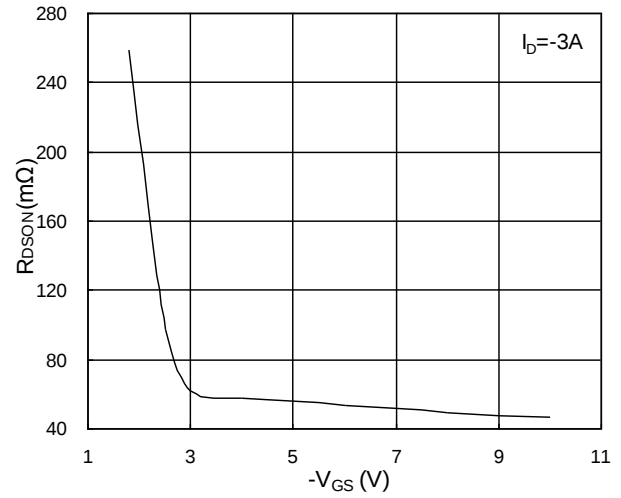


Fig.2 On-Resistance vs. Gate-Source

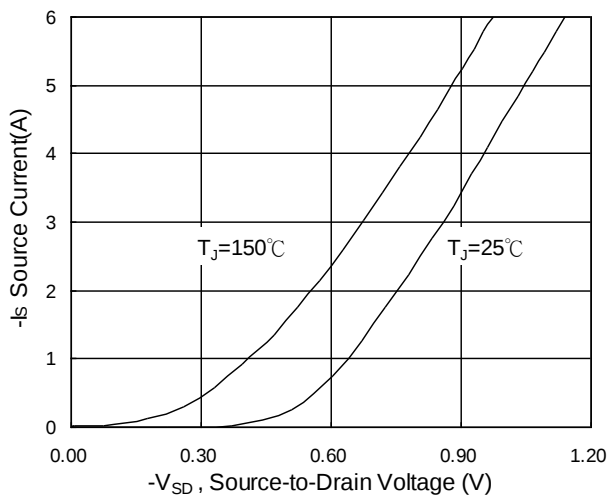


Fig.3 Forward Characteristics Of Reverse

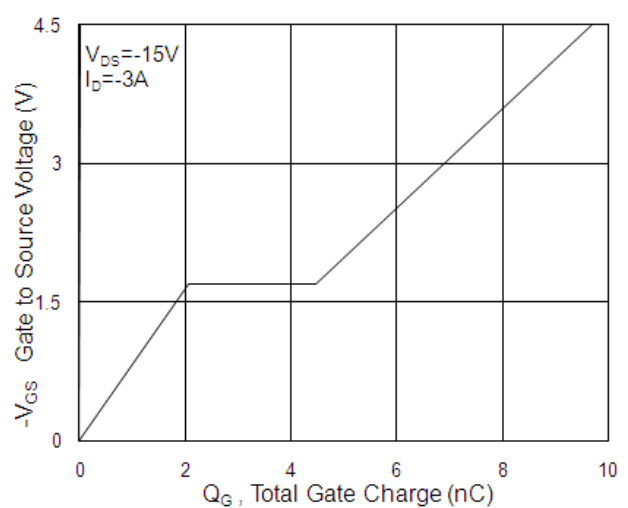


Fig.4 Gate-Charge Characteristics

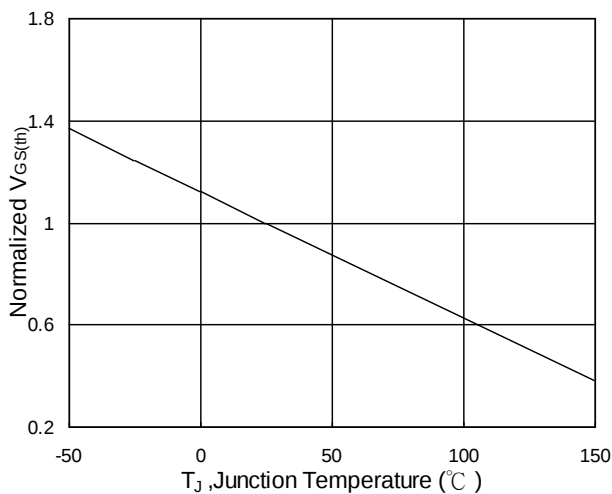


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

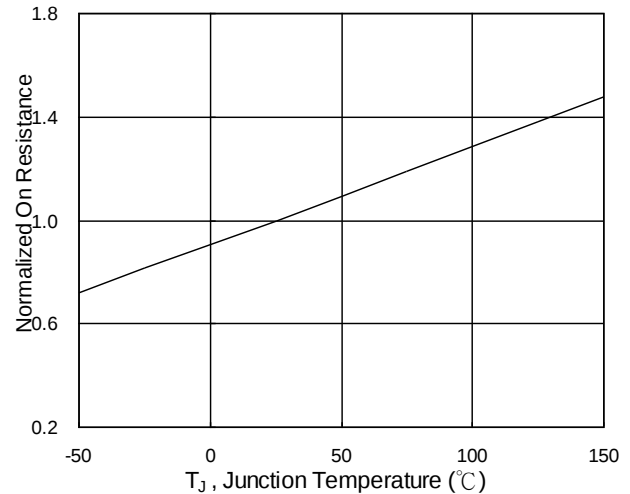
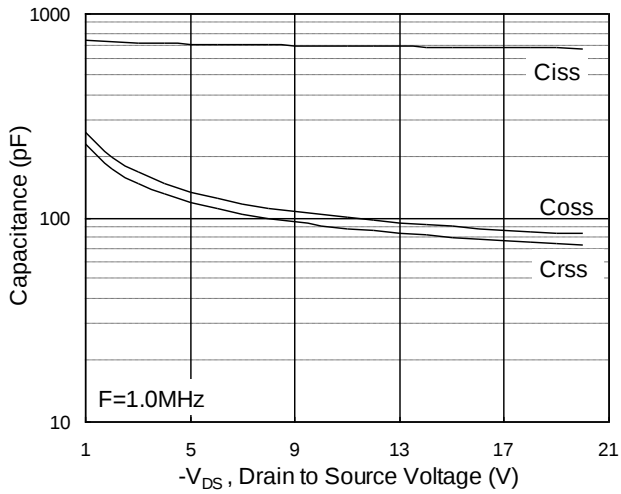
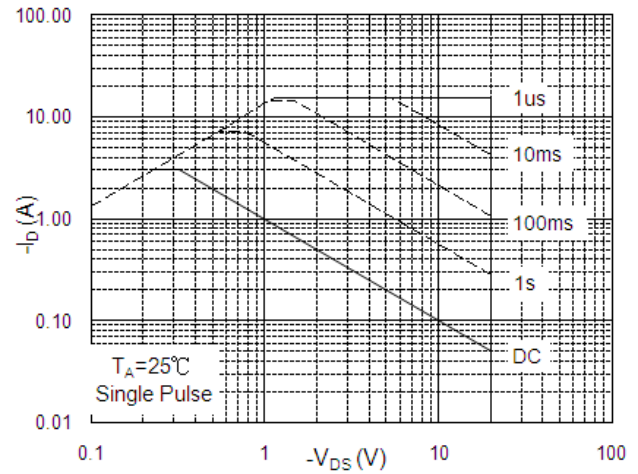
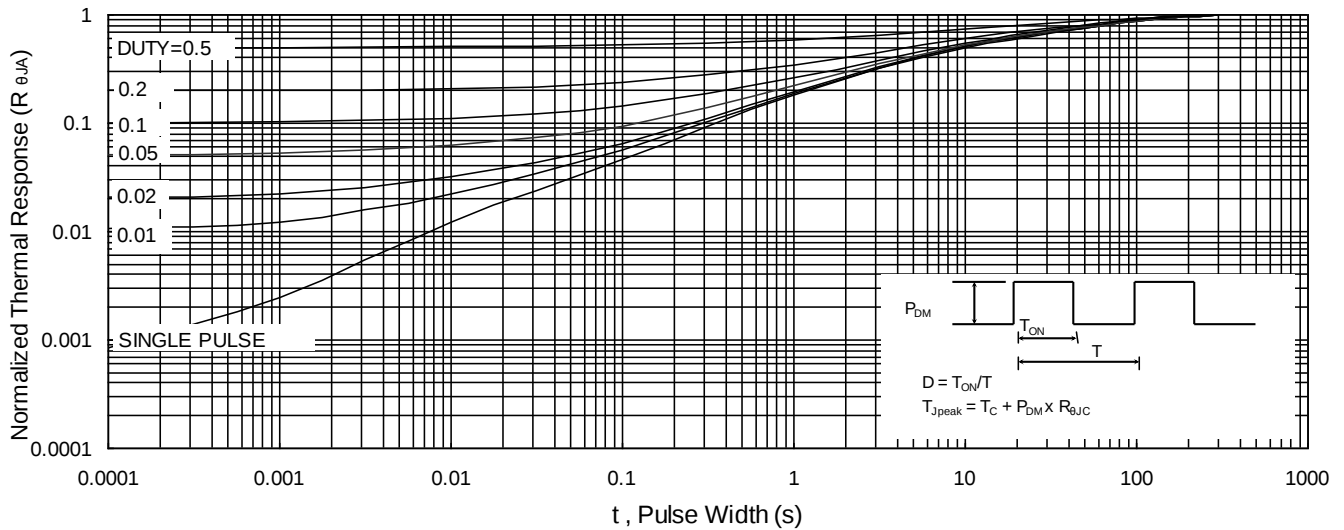
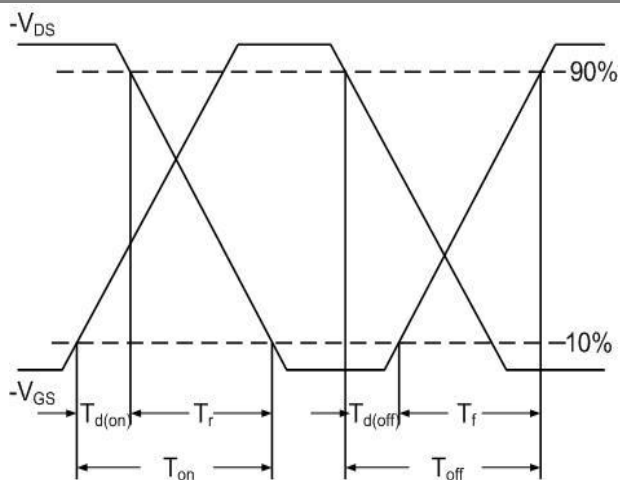
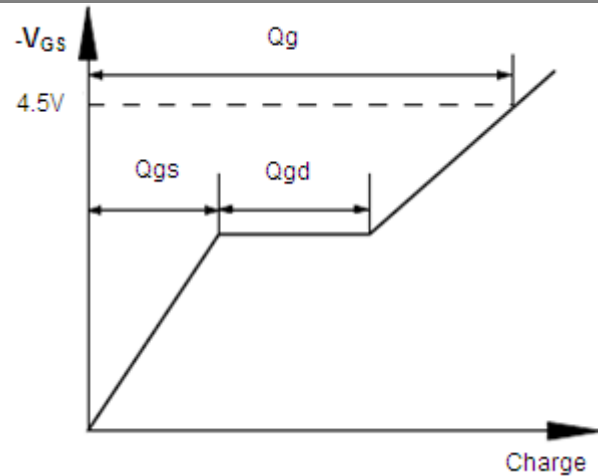


Fig.6 Normalized $R_{DS(on)}$ vs. T_J


Fig.7 Capacitance

Fig.8 Safe Operating Area

Fig.9 Normalized Maximum Transient Thermal Impedance

Fig.10 Switching Time Waveform

Fig.11 Gate Charge Waveform